REMARKS

Applicants appreciate the time taken by the Examiner to review Applicants' present application. This application has been carefully reviewed in light of the Official Action mailed August 29, 2001. Applicants respectfully request reconsideration and favorable action in this case.

Prior to entry of the foregoing amendment, claims 1-5 were pending in the application. Claims 1-5 stand rejected by the Examiner. Claims 1, 4 and 5 have been amended. Claims 1-5 remain pending in the application.

Objections to the drawings

The Examiner objected to the drawings because of the draftsperson's remarks. The Applicant will make such corrections in a timely fashion.

Objections to the claims

The Examiner objects to claim 2 because of several informalities. The Applicant has amended claim 2 to correct these informalities. The Applicant has also amended claims 4 and 5 to make these claims more grammatically correct, although no specific objection was raised by the Examiner.

Rejections under 35 U.S.C. § 103

Claims 1, 2, 4 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 4,481,666 issued to Niwa in view of U.S. Patent 5,666,032 issued to Kresock. The Applicant respectfully traverses this rejection.

The Examiner states in regard to **claims 1 and 4** that Niwa teaches "a method for determining the position of a feature within the scan that is effective at the operating frequency of the scan and using a limited bandwidth video signal." The Examiner asserts that this method discloses all of the limitations of the claims except overlap "between the beam on portion of the scan," which the Examiner asserts is disclosed by Kresock. The Applicant respectfully submits that these limitations are not disclosed by the references, either individually or in combination.

More specifically, the Examiner states that Niwa teaches "determining the reference feature to be an edge over which the video signal changes abruptly (column 1, lines 22-63, column 2, lines 1-4) from one level to a higher or lower-level (column 1, lines 31-47)". In

fact, the reference does not disclose such a limitation. The cited portion of the reference discusses the conversion of a video signal to a black and white and (binary) signal based upon a threshold level which may be fixed or variable. There is no indication whatsoever of a reference feature. The reference even appears to teach away from the limitation, stating that "such a method is fully applicable when the average level of the video signal changes relatively slowly, but is not always applied if the video signal level changes abruptly" (column 1, lines 38-41).

The Examiner further states that Niwa teaches "determining whether the beam is only turned on over a short region of the scan (column 4, lines 31-47)". This portion of the reference actually states:

> In this manner, even if the level of video signal obtained by scanning the card 3 is fluctuated, the reading-out can be effected accurately. For instance, even in case that the level of video signal obtained by scanning the card along the b--b' as shown in FIG. 4D is fluctuated to become small, it is possible to perform an accurate reading-out procedure, because the standard value L.sub.0 and the pitch of slice levels become small accordingly.
>
> In the embodiment mentioned above, use is made of a serial type comparing circuit in which each instantaneous value of video signal supplied from the picking-up device 10 is compared successively with each eight slice levels mentioned above, but it is possible to use parallel type comparing circuit such that the video signal is compared with a plurality of slice levels at the same time.

There is no mention of the beam being turned on or off, and there is certainly no disclosure of the beam being turned on only over a short region of the scan.

Although the Examiner correctly notes that Niwa fails to specifically mention overlap between the beam-on portion of the scan, the Examiner asserts that Kresock teaches a system which "represent[s] the degree of overlap... between the beam on portion of the scan and the higher video level part of the feature as the total video signal accumulated in that scan (column 4, lines 59-67)". In fact, this reference makes no mention of any type of overlap between a portion of a scan which is on and a high-level portion of a reference feature. The language referenced by the Examiner instead deals with the elimination of distortion effects by adding digital values to a waveform.

Thus, even if the Niwa and Kresock references could properly be combined, they do not disclose all of the limitations of the claims. In fact, it is not clear that they disclose <u>any</u> of the limitations of the claims. Consequently, claims 1 and 4 are patentable over the references.

As to **claim 5**, the Examiner states that Kresock teaches the recited limitations when, in fact, this reference does not disclose these limitations. For example, the Examiner states that Kresock teaches using a high-to-low, low-to-high video transition as a reference feature (citing column 1, lines 21-40). The referenced language actually states:

> It is well known that flyback type of beam scan control circuits typically found in television image reproduction are limited in achieving the linearity required for photographic printing. It is also known to use controlled analog amplifier drive circuits to drive CRT deflection coils to produce highly linear beam scan. An example using digital control of deflection drive amplifiers is found in U.S. Pat. Nos. 4,142,132 and 4,687,974, in which beam position on the face of the screen is controlled according to digital position values stored in a lookup table. In this way, the beam is incrementally advanced across the face of the tube to positions determined by position values stored in the lookup table. By suitably programming these values into the table, a highly linear beam scan can be produced.

Clearly, this language does not support the Examiner's assertion.

The Examiner also states that Kresock teaches unblanking the electron beam for a short period during the scan (citing column 3, lines 17-38, 17-55). What is actually disclosed by this portion of the reference is that a CRT beam is blanked during the retrace of the scan and a portion of the useful portion of the scan. The beam is unblanked for almost the entire useful scan. Clearly, this does not meet the limitation of the claim as suggested by the Examiner.

The Examiner further states that Kresock discloses "advancing the unblanked-blanked period along the line by a small increment each succeeding scan" (citing column 3, lines 20-55). In fact, the reference teaches that the blanking of the CRT beam occurs at the same part of the scan (i.e., the retrace and the first portion of the useful scan) each time. Thus, Kresock fails to teach this limitation as well.

Still further, the Examiner states that Kresock discloses "sampling in the video amplifier output using an analog-to-digital converter... at a time delay following the unblank-blank period ..., said time delay determined by the video amplifier bandwidth" (citing column 3, lines 1-5 and column 4, lines 1-67). In fact, the reference teaches the use of an a digital-to-analog converter, not an analog-to-digital converter, and it does not mention any kind of delay, video amplifier or bandwidth thereof. Again, this limitation of the claims not met by the reference.

As to **claim 2**, the Examiner asserts that Niwa discloses using a sample having a black-to-white video transition as a reference feature and mathematically processing the

representative video profile to yield to the position of the video edge with respect to the scan. The portions of the reference which are cited by the Examiner (column 1, lines 20-63 and column 2, lines 1-4), however, do not teach or in any way suggest using a black-to-white video transition as a reference feature and processing the profile to obtain a position of this reference feature with respect to the scan.

While the Examiner admits that Niwa fails to teach unblanking the beam for a short period and advancing this period by a small increment each succeeding scan, the Examiner asserts that these limitations are taught by Kresock. As discussed above, these assertions find no support in the actual language of the reference.

As is the case with claims 1 and 4, the references do not disclose all of the limitations of claim 5. Consequently, this claim is patentable over the references.

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,047,861 issued to Houchin, et al. in view of U.S. Patent 5,666,032 issued to Kresock. The Applicant respectfully traverses this rejection.

The Examiner states that Houchin teaches all the steps of the claimed method, except for incrementally moving a plurality of pixels within the raster scan. The Applicant respectfully submits that these limitations are not disclosed by the references, either individually or in combination.

More specifically, the Examiner states that Houchin teaches "choosing a predetermined plurality of pixels of said raster scan to be calibrated (column 3, lines 35-56)". The language cited by the Examiner does not teach or suggest the selection of a predetermined plurality of pixels to be calibrated, but instead simply discloses that the system of Houchin can be calibrated, and that pixels correction values generated during calibration are applied in the generation of output pixel signal values.

The Examiner further states that Houchin teaches "moving at least one feature at the image plane having video contrast adjacent to the landing point of said plurality of pixels (column 4, lines 44-68)". Again, this is not taught or suggested by the cited language. Houchin teaches that "an ideal scanner would output an identical code value... for each pixel. ... to the extent that [ ] code value variations occur consistently over time, they can be corrected out" (column 4, lines 47-55). Thus, if anything, the reference teaches against using a feature at the image plane having video contrast.

Still further, the Examiner states that Houchin teaches "strobing said beam for said plurality of pixels within said raster scan (column 3, lines 39-56)". As noted above, this

portion of the reference teaches that pixel correction factors are applied to input pixel values in order to produce corrected output pixel values. Strobing a beam is not mentioned or suggested in any way.

Still further, the Examiner states that Houchin teaches "integrating the signal resulting from said plurality of pixels as said plurality of pixels move towards said at least one video contrast feature (column 3, lines 39-56)". As pointed out in the previous paragraph, this portion of the reference teaches that correction of pixel signal values. There is no teaching or suggestion whatsoever of integrating pixels as they move toward a video contrast feature.

While the Examiner admits that Houchin fails to teach incrementally moving a plurality of pixels within a raster scan, it is asserted that this is taught by Kresock. The Examiner states that Kresock discloses "incrementally moving said plurality of pixels column 3, lines 20-35". The Applicant points out that the cited portion of the reference does not teach or suggest moving a plurality of pixels, but instead discloses the retrace of a CRT beam, followed by incremental movement of the beam across the phosphor screen in accordance with digital values from LUT 18. The Applicant respectfully submits that the mere use of a digitally positioned CRT beam in no way suggests " incrementally moving said plurality of pixels within said raster scan" as recited in the claim.

As explained above, the references cited by the Examiner fail to teach or suggest all of the limitations of claim 3. Consequently, this claim is patentable over the references.

Conclusion

For at least the foregoing reasons, the Applicant submits that the Examiner's rejections and objections have been overcome and that the claims are allowable. The Applicant therefore respectfully requests that the Examiner reconsider the rejections and objections and allow the claims. If any extensions of time are necessary to prevent the above referenced application from becoming abandoned, the Applicant hereby petitions for such extensions. If any fees are inadvertently omitted, or if any additional fees are required, or if any amounts have been overpaid, please appropriately charge or credit those fees to Deposit Account No. 50-0456 of Gray Cary Ware & Freidenrich, LLP.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

PURSUANT TO 37 CFR 1.111

APPENDIX 1

CLAIMS:

2. **(amended)** A method for determining the position of a feature within the scan that is effective at the operating frequency of the scan and using a limited bandwidth video signal, comprising the steps of:

using a sample having a black to white video transition as a reference feature

unblanking the beam for a short period;

advancing the unblanked period along the line by a small increment each succeeding scan[.];

sampling the amplifier output by an analog-to-digital converter at a time delay following the unblank-blank period determined by the video amplifier bandwidth;

arranging the successive samples for giving a video profile representative of the video profile of a slow scan with a wide beam; **and**

mathematically processing the representative video profile to yield the position of the video edge with respect to the scan.

4. **(amended)** In an electron beam equipment, a method for determining the dimensions of the scan of the electron beam by identifying a feature on the sample and the position of the feature within the scan for calibrating the scan amplitude, said method being effective at the operating frequency of the electron beam scan, but using a limited bandwidth video signal, comprising the steps of:

determining an edge over which the video signal changes from one level to a higher or lower level as a reference feature;

turning on the electron beam over only a short region of the electron beam scan; **and**

representing as the total video signal accumulated the degree of overlap between the beam on portion of the scan and the higher video level part of the feature.

5. **(amended)** The method of Claim 1, further wherein the steps include:

using the high to low, low to high video transition as a reference feature;

unblanking the electron beam for a short period during the scan;

advancing the unblank-blanked period along the line by a small increment each succeeding scan;

sampling the video amplifier output using an analog-to-digital converter at a time delay following the unblank-blanked period, said time delay determined by the video amplifier bandwidth; **and**

a means of stepping the unblank-blanked period along the line by sub pixel increments by inserting a programmable delay between the blanking pulse generator and the blanker itself.